

THE DESIGN AND FABRICATION MANUALLY OPERATED SEED PLANTER MACHINE

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ABSTRACT

Agro-Technology is the process of applying the technology innovation occurring in daily life and applying that to the agriculture sector which improves the efficiency of the crop produced and also to develop a better mechanical machine to help the agriculture field which reduces the amount and time of work spent on one crop. Hence in this work of project we decided to design a better mechanical machine which is available to the farmers at a cheaper rate and also which can sow and seed the crop at the same time. This project consists of the better design of the machine which can be used specifically for rice, wheat crops, etc. Developed agriculture needs to find new ways to improve efficiency. One approach is to utilize available information technologies in the form of more intelligent machines to reduce and target energy inputs in more effective ways than in the past. Precision farming has shown the benefits of this approach, but we can now move towards a new generation of equipment. The advent of autonomous system architectures gives us the opportunity to develop a complete new range of agricultural equipment based on small smart machines that can do the right thing, in the right place, at the right time in the right way.

KEYWORDS: Agro-Technology & crop

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INTRODUCTION

Planters

On the basis of the power source used to provide the draft (i.e. the horizontal component of the force required to propel the machine through the soil), planters can usually be classified as: Human Animal, Tractor-powered

Human-Powered Planters

Human-powered planters can typically be categorized as being either:

- hand-held/carried; or pulled or pushed.

Animal-Powered Planters

Animal-powered planters are typically categorised as pulled.

Tractor-Powered Planters

Tractor-powered planters can generally be categorised as being:

- Trailed

- Semi-mounted
- Front/mid/rear

TYPES OF PLANTER

Planters can be broadly classified as being:

- Broadcast drill
- Precision dibble
- Specialized

LITERATURE SURVEY

The present review provides brief information about the various types of innovations done in seed sowing equipment. The basic objective of sowing operation is to put the seed and fertilizer in rows at desired depth and seed to seed spacing, cover the seeds with soil and provide proper compaction over the seed. The recommended row to row spacing, seed rate, seed to seed spacing and depth of seed placement vary from crop to crop and for different agro-climatic conditions to achieve optimum yields. Seed sowing devices plays a wide role in agriculture field.

“Solar Powered Seed Sowing Machine” Today’s era is marching towards the rapid growth of all sectors including the agricultural sector. To meet the future food demands, the farmers have to implement the new techniques which will not affect the soil texture but will increase the overall crop production. This paper deals with the various sowing methods used in India for seed sowing and fertilizer placement. The comparison between the traditional sowing method and the new proposed machine which can perform a number of simultaneous operations and has a number of advantages. As day by day the labor availability becomes the great concern for the farmers and labor cost is more, this machine reduces the efforts and total cost of sowing the seeds and fertilizer placement.

“Solar Operated Automatic Seed Sowing Machine”

The real power required for machine equipment depends on the resistance to the movement of it. Even now, in our country 98% of the contemporary machines use the power by burning of fossil fuels to run IC engines or external combustion engines. This evident has led to widespread air, water and noise pollution and most importantly has led to a realistic energy crisis in the near future. Now the approach of this project is to develop the machine to minimize the working cost and also to reduce the time for digging and seed sowing operation by utilizing solar energy to run the robotic machine. In this machine solar panel is used to capture solar energy and then it is converted into electrical energy which in turn is used to charge 12V battery, which then gives the necessary power to a shunt wound DC motor. This power is then transmitted to the DC motor to drive the wheels. And to further reduction of labor dependency, IR sensors are used to maneuver robot in the field.

PROPOSED WORK & MANUFACTURING PROCESS PROPOSED WORK

To prepare any machine part, the type of material should be properly selected, considering design, safety and following points. The selection of material for engineering application is given by the following factors:-

- Availability of materials.

- Suitability of the material for the required components.
- Suitability of the material for the desired working conditions.
- Cost of the materials.

In addition to the above factors the other properties to be considered while selecting the material are as follows:-

Physical Properties

These properties are color, shape, density, thermal conductivity, electrical conductivity, melting point etc.

Mechanical Properties

The properties are associated with the ability of the material to resist the mechanical forces and load.

Mild Steel

Why steel, in particular simply because, in my humble opinion, it is the greatest material mankind has for construction. It is cheap, strong, readily available, easily cut, joined, and formed. Wood can be light and stiff, but not very strong.

The best aluminum is strong and light, but very difficult to join. Titanium is superb in terms of strength to weight ratio and stiffness but it's incredibly expensive, difficult to obtain, and even more difficult and expensive to machine properly. There's no way you're ever going to perform a battery- welded-fix on a part made from 7075-T6 aluminium or titanium.

MANUFACTURING PROCESS

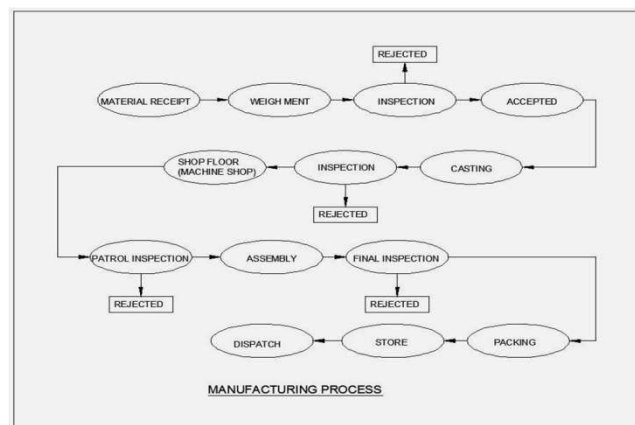


Figure 1

Manufacturing processes are the steps through which raw materials are transformed into a final product. The manufacturing process begins with the creation of the materials from which the design is made. These materials are then modified through manufacturing processes to become the required part. Manufacturing processes can include treating (such as heat treating or coating), machining, or reshaping the material. The manufacturing process also includes tests and checks for quality assurance during or after the manufacturing, and planning the production process prior to manufacturing.

Metal Cutting

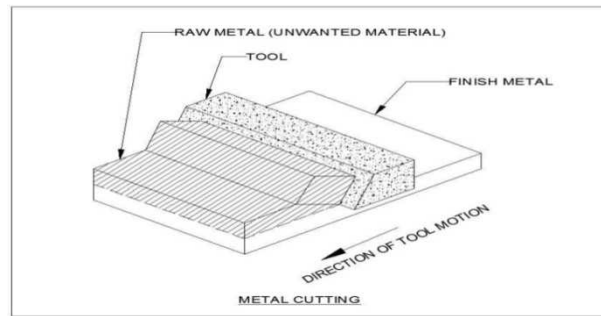


Figure 2

Metal cutting or machining is the process by removing unwanted material from a block of metal in the form of chips.

Cutting processes work by causing fracture of the material that is processed. Usually, the portion that is fractured away is in small sized pieces, called chips. Common cutting processes include sawing, shaping (or planning), broaching, drilling, grinding, turning and milling. Although the actual machines, tools and processes for cutting look very different from each other, the basic mechanism for causing the fracture can be understood by just a simple model called for orthogonal cutting.

Sawing

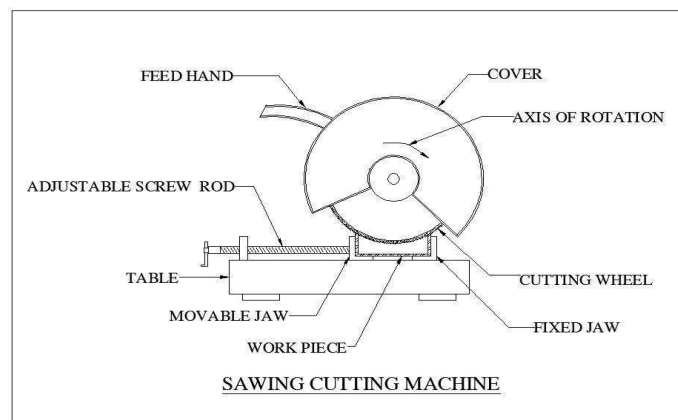


Figure 3

Cold saws are saws that make use of a circular saw blade to cut through various types of metal, including sheet metal. The name of the saw has to do with the action that takes place during the cutting process, which manages to keep both the metal and the blade from becoming too hot. A cold saw is powered with electricity and is usually a stationary type of saw machine rather than a portable type of saw.

The circular saw blades used with a cold saw are often constructed of high speed steel. Steel blades of this type are resistant to wear even under daily usage. The end result is that it is possible to complete a number of cutting projects before there is a need to replace the blade.

High speed steel blades are especially useful when the saws are used for cutting through thicker sections of metal.

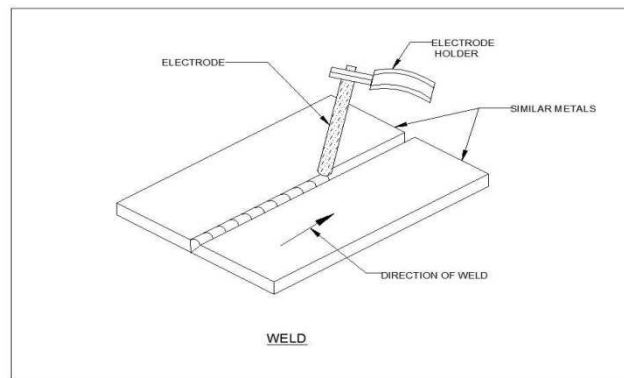


Figure 4

Welding

Welding is a process for joining similar metals. Welding joins metals by melting and fusing 1, the base metals being joined and 2, the filler metal applied. Welding employs pinpointed, localized heat input. Most welding involves ferrous-based metals such as steel and stainless steel. Weld joints are usually stronger than or as strong as the base metals being joined

CONSTRUCTION & WORKING PRINCIPLE CONSTRUCTION

Our Proposed Model “Manually

OPERATED SEED PLANTER MACHINE” need so many raw materials which are mentioned in above chapter. For that materials first of all we purchased the raw materials based upon requirement and for that we’ve planned to how to buy. After buying we cut raw materials in required dimensions in a precise manner by using hand wheel cutting machine. After that we’ve gone for some rough turning and finishing by using lathe and grinding machines. After that for assembly purpose we went for welding for permanent joint wherever we require and joined with rivets wherever we require rigidly fixed joints. Wheel and chain sprocket are used to transmit the motion of seed and plunger is used for operation.

WORKING PRINCIPLE

Our proposed model manually operated seed planter Machine is mainly consists of Power wheel, Chain drives, cam plate and see hopper. It’s look like a trolley. The main working principle this model is when we are pulling a vehicle the power wheel will rotate including normal wheels which placed in the middle of the vehicle. This power wheel is connected with chain drive to the sprocket on a shaft. Above the sprocket shaft there is another shaft on that shaft cam is mounted. That cam will rotate when a gear engaging with the gear of sprocket shaft. This cam is able to push the plunger in a downward direction. On that time flapper will open place the seed in the dig. And seeds will be travel into plunger with the help of seed metering plate. It will be rotated by primary cam shaft rotation. It has some holes through this holes seeds will be travel into the plunger. It will allow the only one seed at one revolution of the shaft

ADVANTAGES ANDAPPLICATIONS ADVANTAGES

- It will be useful for seed sowing at some uniform distance
- Easy fabrication Low cost
- No electricity required

- It will reduce the time complexity for seed sowing.

Applications

- High yielding cultivation Mainly useful for farmers

CONCLUSIONS

This manual seed planter machine has considerable potential to greatly increase productivity. Other countries of the world where the two wheel tractor is the main traction unit in farming. The main task now is to promote this technology and have available to farmers at an affordable price. The manual Seed Planter machine can be readily made from local components in workshops. The only specialized items required are the seed meters plunger which can be sourced at an inexpensive price from local promoter and plunger is easily manufactured. By using of this machine, achievement of flexibility of distance and depth variation for different seed plantation is possible.

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